

REMARKS

I. Status of Claims

Claims 1-37 are pending. Claims 1, 8, 20 and 36 are independent. Applicant thanks the Examiner for the indication of allowable subject matter in claims 23-34. Claims 1, 21, 23, 29 and 30 have been amended herein to address minor typographical errors. Claims 1-22 are believed allowable over the prior art as will be argued below. Claims 36 and 37 are newly provided herein. Support for these new claims can be found in the originally filed specification, at least at page 7, line 9 to page 8, line 22, as well as in FIG. 4. Accordingly, no new matter has been introduced by these amendments or newly filed claims and entry of the same is respectfully requested.

II. Rejection of claims 1-4, 6-10, 12 and 13 under 35 U.S.C. 102(b) as being anticipated by Matsuda et al. (US 5,739,667)

In the final rejection, the Examiner maintains that claims 1-4, 6-10, 12 and 13 are anticipated under 35 U.S.C. 102(b) by Matsuda et al. (US 5,739,667, hereinafter "Matsuda"). Applicant respectfully requests reconsideration of these rejections because Matsuda, neither explicitly nor implicitly, discloses, teaches or suggests all of the limitations of these claims. In particular, claim 1 as previously amended requires:

A digital device capable of recharging a rechargeable battery comprising;
a consuming current detect unit for detecting a consuming current input to the digital device;
a control unit for generating a control signal based on the consuming current and a battery recharging current;
a recharging current detect unit for detecting the battery recharging current as the battery is recharged; and
a recharging control unit for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit. (Emphasis added).

As recited, claim 1 includes *a control unit and a recharging control unit*. The control unit is for generating a control signal based on the consuming current and a battery recharging current. The recharging control unit is for regulating the current to the rechargeable battery in

proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit. An example of this configuration is seen in Applicant's FIG. 2. There, a control unit 20 is supplied with input signals from the consuming current detect unit 10 *and* the recharging current detect unit 40. Also, a recharging control unit 30 has an input from the control unit 20 as well as an input from the recharging current detect unit 40. Matsuda simply does not disclose, teach or suggest this unique arrangement.

Matsuda's FIG. 4 discloses a recharging control unit 54 that regulates the current to the battery (through Tr_1) and has input from a control unit 56 and the detected battery recharging current (from resistors R_{0-4}). However, even if it is assumed *arguendo* that Matsuda's element 54 discloses a recharging control unit as presently claimed, nowhere does Matsuda also disclose a *control unit* for generating a control signal based on the consuming current and a battery recharging current. At best, even if Matsuda's controller 56 is considered a control unit, Matsuda does not disclose, teach or suggest that the control unit 56 generates a control signal based on the consuming current *and* the battery recharging current. Element 56 is only disclosed as having an input from battery recharging current (through element 55). As such, Matsuda does not disclose, teach or suggest all elements as instantly claimed.

In responding to these arguments, the Examiner states that Matsuda discloses in column 6, lines 53-57 and FIG. 1, an element 10 for detecting the battery recharging current and an element 11 for detecting the consuming current. Matsuda further discloses in column 7, lines 6-7 an element 16 for controlling the battery charging current. This explicit disclosure of Matsuda is not in dispute. However, that Matsuda discloses these elements is not enough to support the anticipatory rejection as asserted. What remains missing from the disclosure of Matsuda are the several additional claim elements including the arrangement of these elements. The claim recites a control unit *and* a recharging control unit. The claim also recites that the control unit generates a control signal based on the consuming current and the battery recharging current *and* that the recharging control unit regulates the current to the battery in proportion to the control signal output from the control unit and the detected battery recharge current. In the rejection, the Examiner asserts that element 16 discloses a control unit. The rejection further asserts that elements 4, 16 and 56 disclose a recharging control unit. First, element 56 is not shown in FIG. 1 so that the rejection has not made clear how the claim is anticipated. Second, the rejection has

merely restated the functional elements of the control unit and recharging control unit without explaining how or where Matsuda actually discloses them. That is, the rejection has not made clear where or how in FIG. 1 (or anywhere in Matsuda) a recharging control unit is provided that regulates current to the battery in proportion to *the control signal output from the control unit and* the detected battery recharging current. Nor does the rejection make clear where or how a control unit is provided that generates a control signal based on the consuming current *and* the battery recharging current. This unique arrangement of elements is simply not disclosed, taught or suggested by Matsuda.

The present application provides a “control unit for generating a control signal based on the consuming current and a battery recharging current” and “a recharging control unit for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit.” This unique combination reduces the number of required components as compared to Matsuda. That is, whereas the present invention uses a control unit (e.g. 20) to provide a control signal, Matsuda has in place several operational amplifiers (540-3, 4, 5 and 6), a PWM Comparator (542) and a triangular wave generator (541) to control the recharging current. Such additional components are eliminated by embodiments of the invention which alleviates the increasing production costs.

In all, Matsuda fails to disclose, teach or suggest, either explicitly or implicitly all the limitations of claim 1. Matsuda does not disclose, teach or suggest a control unit for generating a control signal based on the consuming current *and* a battery recharging current, as recited in Applicant’s claim 1. Therefore, claim 1 is allowable over Matsuda for the reasons given above. Moreover, dependent claims 2-7 are allowable for the reasons given above by virtue of their dependence on claim 1.

Similar to claim 1, method claim 8 recites the step of generating a control signal based on a detected consuming current *and* a detected battery recharge current which control signal is used to regulate the current to the battery. Again, Matsuda does not disclose, teach or suggest such a method wherein a control signal is based on a detected consuming current and detected recharging current. Thus, Matsuda fails to disclose, teach or suggest, either explicitly or implicitly, all the limitations of claim 8 and thus claim 8 is allowable over Matsuda for the

reasons given above and with reference to the arguments of claim 1. Moreover, dependent claims 9-19 and 35 are allowable by virtue of their dependence from claim 8.

III. Rejection of claim 20 under 35 U.S.C. 103(a) as obvious over Hutchinson, IV et al. (US 6,118,250)

The Examiner has again rejected claim 20 under 35 U.S.C. 103(a) as obvious over Hutchinson, IV et al. (US 6,188,250, hereinafter "Hutchinson"). Applicant respectfully requests reconsideration of this rejection because Hutchinson does not make obvious the limitations of claim 20. In particular, claim 20 requires:

A method for recharging a rechargeable battery in a digital device comprising:

determining whether a voltage of the rechargeable battery is greater than 5 volts, and if so, determining that the battery is partially discharged and performing a recharge operation according to a state of the digital device being used. (Emphasis added).

Hutchinson does not make obvious the claimed method. Nowhere does Hutchinson disclose, teach or suggest a recharge operation *according to a state of the digital device being used*. Rather, Hutchinson merely teaches a recharge method without regard to a state of a digital device. For example, the recharge method taught by Hutchinson in figure 5 only accounts for a battery voltage as shown in decision steps 204 and 210. Hutchinson's method does not account for a state of a digital device being used.

In the response to arguments, the Examiner cites to column 3, lines 12-16 of Hutchinson as disclosing the performance of a recharge operation according to a state of the digital device being used. However, the cited portion of Hutchinson merely discloses that an internal battery is fast-charged to near full capacity once its voltage exceeds a threshold and that an external battery is trickle charged then fast charged. The threshold of Hutchinson is a minimum operating voltage of a phone. However, a "minimum operating voltage" of a phone is not a state of the phone. Nowhere does Hutchinson disclose, teach or suggest that a recharge operation is based on anything but the battery voltage.

Thus, Hutchinson fails to disclose, teach or suggest, either explicitly or implicitly all the limitations of claim 20. In particular, Hutchinson does not disclose performing a recharge operation *according to a state of the digital device being used*, as recited in Applicant's claim 20.

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Therefore, claim 20 is allowable over Matsuda for the reasons given above. Moreover, dependent claims 21 and 22 are allowable for the reasons given above by virtue of their dependence on claim 20.

IV. New Claims 36 and 37

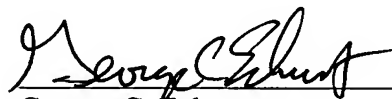
Applicant has included new claims 36 and 37 in the above amendment. Because neither Matsuda nor Hutchinson disclose, teach or suggest each and every feature of new claims 36 and 37, allowance of the same is respectfully requested.

V. Conclusion

In view of the above, it is believed that the above-identified application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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